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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/765,229	01/18/2001	Koujirou Sekine	15162/03060	7378

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EXAMINER
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STAHL, MICHAEL J

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 03/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/765,229

Applicant(s)

SEKINE ET AL.

Examiner

Mike Stahl

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 November 2003.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 1-5, 16-22, 29 and 30 is/are allowed.  
6) ☒ Claim(s) 6-15 and 23-28 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous office action (mailed June 20, 2003) has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 19, 2003 has been entered. Claims 1-30 are pending. All claim rejections made in the previously final office action are withdrawn in view of the amendments received September 22, 2003 and November 19, 2003 and their accompanying remarks.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6-15 and 23-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Deacon et al. (US 5488681).

Claims 6 and 24: Deacon discloses a device (fig. 3) including a waveguide portion 64 for guiding light; and a periodic structure portion 62 to which light is directed by the waveguide portion, and which has a periodic structure with a first refractive index portion 68 and a plurality of second refractive index portions 66; wherein the second index portions recur in a periodic

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pattern relative to the first index portion, and wherein each recurrence of the second index portion has a variable refractive index. When the second index portions are in a first refractive state, the device passes light having a first characteristic, and when the second index portions are in a second refractive state (i.e. the grating is “on”), the device passes light having the first characteristic and redirects light having a second characteristic. In this case, the first characteristic is any wavelength that is not in the grating reflection band, and the second characteristic is a wavelength within that band. All other wavelengths out of the band pass through the grating without redirection (col. 11 line 50 – col. 12 line 3). Thus the Deacon device meets the requirements of claim 6.

Claim 7: Another waveguide portion (the rightmost portion of waveguide 64) guides light emitted from the periodic structure portion.

Claim 8: The device includes a voltage applying portion 70/72 for applying a voltage to the periodic structure to vary the variable refractive index.

Claims 9-10 and 26: The fig. 3 device described above meets the limitations of claims 9 and 10.

Claims 11 and 28: The gratings may be cascaded as shown in fig. 17, in which case the upstream gratings act as a light source portion that can vary wavelengths of emitted light relative to the downstream gratings.

Claims 12-13: The device includes a waveguide portion which directs light to the periodic structure portion and a separate waveguide portion which directs light from the periodic structure portion.

Claim 14: The device may include a third waveguide portion for guiding light from the periodic portion (e.g as shown in fig. 7).

Claim 15: The device includes a voltage applying portion as already pointed out with respect to claim 8.

Claims 23, 25, and 27: The alternate embodiment of fig. 24 has structure and operation similar to that of the fig. 3 device, except that the fig. 24 device may operate as a polarization filter, i.e. when the grating is “off” both polarizations pass through, but when the grating is “on” one of the polarizations is diffracted out of the waveguide.

Claims 6-7, 9, 11-13, 24, 26, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Judkins et al. (US 5647039).

Claims 6 and 24: Judkins discloses a device (fig. 1; col. 6 lines 35-41) including a waveguide portion 12 for guiding light; and a periodic structure portion 18 to which light is directed by the waveguide portion, and which has a periodic structure with a first refractive index portion 14 and a plurality of second refractive index portions 20; wherein the second index portions recur in a periodic pattern relative to the first index portion, and wherein each recurrence of the second index portion has a variable refractive index. When the second index portions are in a first refractive state, the device passes light having a first characteristic, and when the second index portions are in a second refractive state, the device passes light having the first characteristic and redirects light having a second characteristic. In this case, the first characteristic is any wavelength that does not coincide with the wavelength deflected by grating

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18 when it is “on”, and the second characteristic is the deflected wavelength (illustratively  $\lambda_p$  in fig. 1).

Claim 7: The device further includes another waveguide portion for guiding light emitted from the periodic structure portion 18.

Claims 9, 11-13, 26, and 28: The Judkins device described above has all the recited elements, noting with regard to claim 11 that it is considered inherent that a variable wavelength source would be coupled to the device during its normal use in a wavelength division multiplexed system, at least in the sense that the wavelengths coming into the device are varied based upon any channel adding or dropping which takes place upstream of the device.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Judkins et al. (cited above).

Claim 14: Judkins discloses a photodetector 30 for intercepting light which is diverted from the grating. It would have been obvious to a skilled person to alternatively provide a second waveguide to intercept the diverted light in order to conduct it to a remote location. This would avoid the need to place a photodetector directly over the grating region and would enable

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the use of a single remote photodetector array to receive light from multiple gratings, wherein each grating has its own tap waveguide leading to a corresponding part of the array.

### ***Response to Arguments***

Applicant's comments regarding the rejection under Roberts (US 6175671) are persuasive in view of the amendments to various independent claims. Applicant amended these claims to recite essentially that in one refractive state of the second refractive index portions, light having a second characteristic is either redirected or blocked, whereas in both refractive states light having a first characteristic is passed without redirection. Roberts does not teach or suggest this functionality. There does not appear to be any characteristic that a light beam could have which would qualify the beam to pass through the variable index portions (e.g. 22 in fig. 7) regardless of their refractive state.

Applicant's remarks regarding the rejection of claims 1-3 and 16-18 under Gerritsen (US 4850682). In particular, Gerritsen does not teach blocking light having a second characteristic in one state of the grating (figs. 1A-1B) while deflecting it in the other state, and letting light having a first characteristic pass through the grating in both states. In the Gerritsen device both polarizations pass through the grating in both states, i.e. neither polarization is blocked.

### ***Allowable Subject Matter***

Claims 1-5, 16-22, and 29-30 are allowed. Claims 1 and 16 recite that the device, in either a first or a second refractive state of the second index portions, passes light having a first characteristic; whereas light having a second characteristic is *blocked* in the first refractive state

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and *deflected* in the second refractive state. The references of record do not teach or suggest a device having a periodic structure which operates in this manner. Various cited references provide for passing light of a first characteristic in both refractive states and deflecting light of a second characteristic in one refractive state, but they do not show blocking light of the second characteristic in one refractive state *and* deflecting that light in the other refractive state. Claims 2-5, 17-22, and 29-30 are allowable by dependence from respective parent claims 1 or 16.

### ***Conclusion***

Any inquiry concerning this communication should be directed to Mike Stahl at (571) 272-2360. Official communications which are eligible for submission by facsimile and which pertain to this application may be faxed to (703) 872-9306. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at (703) 308-0956 or to the technical support staff supervisor at (703) 308-3072.

MJS

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Patent Examiner  
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HEMANG SANGHAVI  
PRIMARY EXAMINER

February 18, 2004